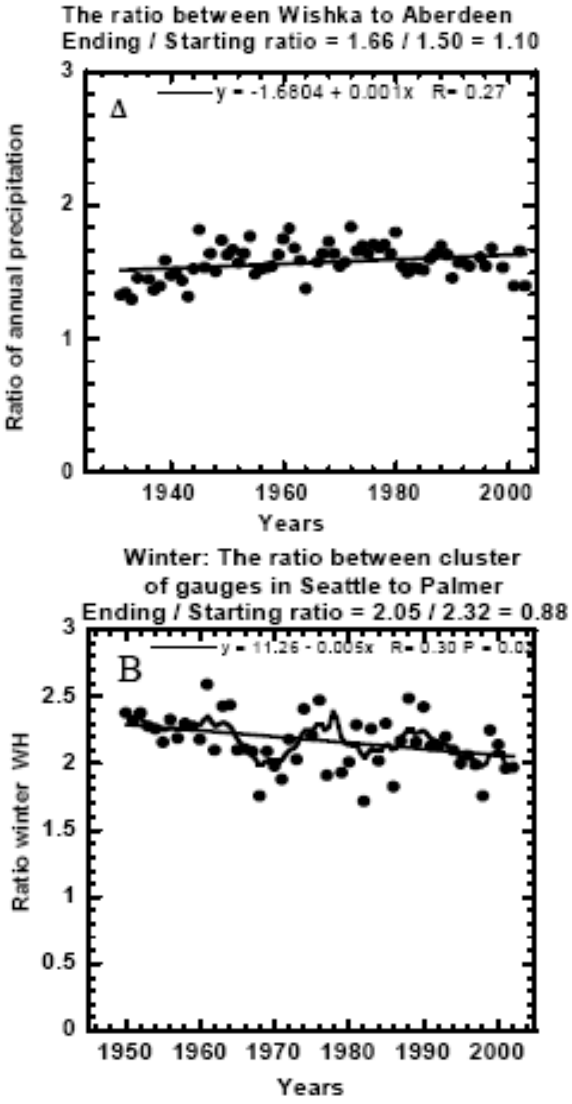
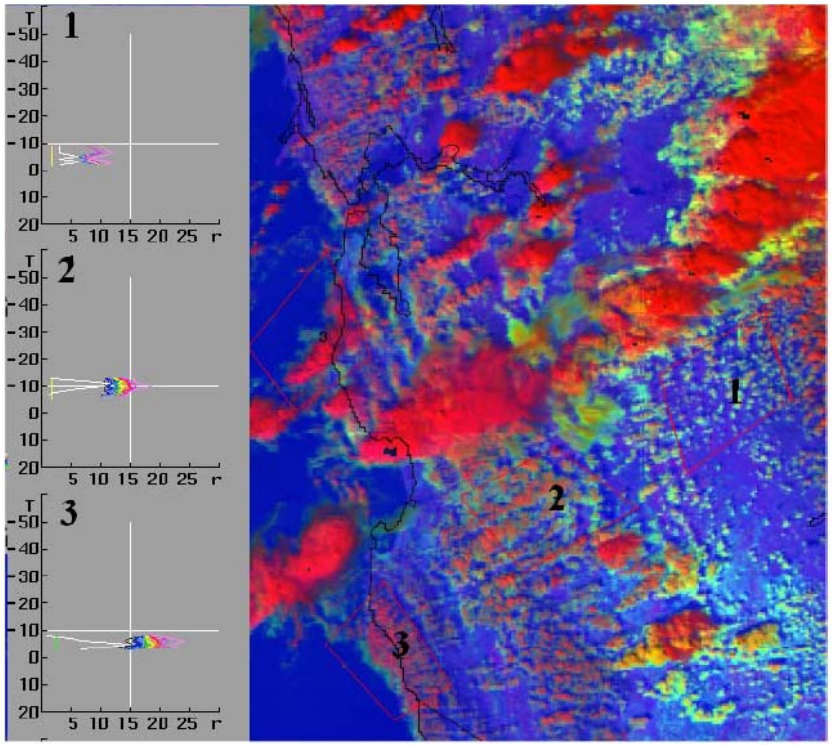
Analysis of historical precipitation and streamflow data shows a decreasing trend in the orographic enhancement factor in mountains downwind of polluted cities

Above: The locations of hilly and plain rain gauges in the relatively pristine area of the Olympic peninsula, Washington state: Wishka (hilly) vs. Aberdeen (plain) gauge, and the relatively polluted Seattle area: Palmer (hilly) vs. cluster of gauges in Seattle (plain)

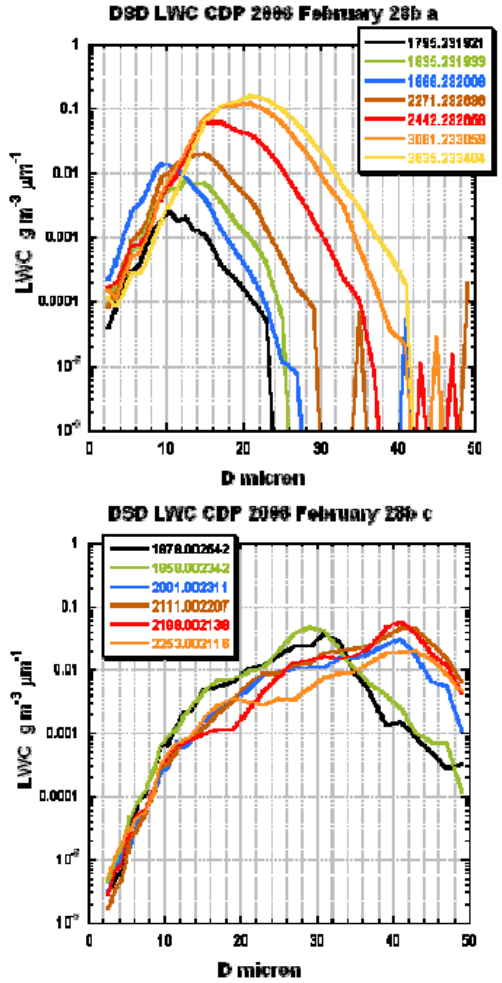


Right: The ratio of annual precipitation in the relatively pristine Olympic peninsula: (top) Wishka vs. Aberdeen, and the ratio in relatively polluted area: (bottom) Palmer vs. Seattle.

Evidence of aerosol effects on cloud drop size from satellite and aircraft measurements during the SUPRECIP-2 field campaign



Aqua MODIS image of the clouds in the San-Francisco-Sacramento area on 2006 02 28 21:00Z. Polluted clouds with small drops appear yellow (see Area 1), whereas the ice clouds appear red. Pristine water clouds appear magenta (see Area 3). The line graphs provide the relations between the satellite indicated cloud top temperatures and the cloud top particle effective radii. The effective radius near cloud top is much smaller than the precipitation threshold of 14 µm at the foothills in Area 1, but over the coastline in Area 3, the effective radius is much larger than the precipitation threshold of 14 µm.



Top: Cloud 1 over the western slopes of the Sierra Nevada. Each line represents the gross cloud drop size distribution of a whole cloud pass. The passes are ordered in ascending altitude. Bottom: Cloud 3 over the hills near Big Sur. The contrast between the small (Cloud 1) and large (Cloud 3) drop size is evident.

Modeling Strategy